

February 17, 2005

OIL AND GAS DOCKET NO. 09-0240219

**APPLICATION OF FALCON GAS STORAGE COMPANY, INC. TO CONSIDER
AMENDING THE FIELD RULES FOR THE WORSHAM-STEED FIELD, JACK
COUNTY, TEXAS**

HEARD BY: Thomas H. Richter, P.E., Technical Examiner
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APPLICANT:

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REPRESENTING:

Falcon Gas Storage Company, Inc.

INTERESTED PARTIES:

Philip Whitworth, attorney
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EOG Resources, Inc.

Best Petroleum Expl. and 3-R Prod.

PROCEDURAL HISTORY

Date of Application:	September 14, 2004
Date of Notice:	October 6, 2004
Date of Hearing:	December 2, 2004
Date of Transcript:	January 31, 2005
PFD Circulation Date:	February 17, 2005

EXAMINERS' REPORT AND PROPOSAL FOR DECISION
STATEMENT OF THE CASE

This is the unprotested application of Falcon Gas Storage Company, Inc. for the Commission to consider amending the field rules for the Worsham-Steed Field as adopted in Order No. 9-3583, effective April 6, 1942, as amended. The subject field is a gas storage reservoir. Falcon seeks amendments to the field rules in order to ensure the integrity of the reservoir as other operators in the area drill through the reservoir to lower formations, in this case, the Newark, East (Barnett Shale). See attached Exhibit "A" for the proposed 9 rules as stated by Falcon. The following is brief synopsis of each:

For all wells that would be drilled within the confines of the Gas Storage Unit boundary and penetrate the storage reservoir:

- Rule No. 1 An operator shall give Falcon a copy of the drilling permit within 2 days of Commission approval and written notice of the date drilling will commence.
- Rule No. 2 Provide Falcon with at least 5 days notice of the date the well will be logged or other tests conducted.
- Rule No. 3 In addition to any logs or tests run by an operator, the well operator shall run any logs or tests requested by Falcon. Falcon will pay for these tests and any associated expenses.
- Rule No. 4 Upon completion of a well, the well operator shall furnish Falcon with copies of the well completion forms.
- Rule No. 5 The operator shall furnish Falcon with a copy of any log with the log heading and that portion of the log that covers the storage interval.
- Rule No. 6 If production casing is set:
- a. Casing centralizers shall be used above and below the storage reservoir;
 - b. Cement shall be circulated from 100' below to 100' above the storage reservoir;
 - c. A cement bond log shall be run no sooner than 24 hours after cementing;
 - d. A copy of the cement bond log shall be provided to Falcon;
 - e. If the bond log shows the cement job was not effective, remedial work shall be required.
- Rule No. 7 For any completed well, the well operator shall install a pressure gauge on the bradenhead and read it at least weekly. If a pressure is found, Falcon shall be notified immediately and the well operator shall state steps necessary to remediate the condition.
- Rule No. 8 If the well is a dry hole, a continuous cement plug will be set from 100' below to 100' above the storage reservoir. In a well with casing that is to be abandoned or plugged back, a continuous cement plug shall be placed from 100' below to 100' above the storage reservoir. These plugs will be tagged. The well operator shall furnish a copy of the W-3 Plugging Report to Falcon.
- Rule No. 9 Upon receipt of a Commission issued drilling permit, Falcon will furnish the well operator with the current known pressure in the storage reservoir.

As originally noticed for hearing, Falcon requested ten rules, several of which contained provisions considered highly objectionable by EOG Resources, Best Petroleum and 3-R Production.

For example, Falcon's originally proposed Rule 10 would have required any operator drilling through the storage reservoir to post a \$10,000,000 bond or other form of surety acceptable to Falcon guaranteeing payment to Falcon for any losses or damages that Falcon might sustain as a result of the drilling activity. Assuming a 3% bond premium, this would add \$300,000 to the cost of drilling a well through the storage reservoir. However, after negotiations, Falcon agreed to drop this requirement and modified some other objectionable provisions, resulting in presentation at the hearing of the nine rules listed in Attachment "A". The former protestants agreed to participate in the hearing merely as interested parties.

LEGAL BACKGROUND

Field rule hearings are called to adopt or amend field rules in order to prevent waste and protect the correlative rights of owners of interests within the field. Generally, the parties entitled to notice are other operators in the field or owners of mineral interests in the field. Any relief granted or changes to rules affect only that particular field.

When a field has passed its productive prime and has been converted to a storage reservoir, the concerns of the operator using that field as a storage reservoir shift. At that time, their major concern is to prevent the loss of stored fluids or gas due to penetration of the reservoir by other operators drilling through to deeper horizons.

Historically, hearings requested by gas storage unit operators to protect their reservoirs have been treated as field rules hearings. As a result of this treatment, notice of hearing is sent only to operators in the field (the storage interval). The outcome of such a hearing is usually the protection of the storage interval, thus preventing waste, by requiring operators drilling through the storage interval properly isolate the gas storage interval whether completing a well or plugging it

In the instant case, Falcon has requested several unusual rules which could adversely affect the rights of mineral interest owners, leaseholders and operators below the storage interval, most of whom did not receive notice of this hearing because they are not currently operators in the field. For example, Falcon's proposed Rule 3 requires operators drilling through the interval to interrupt their normal drilling and completion activities to run whatever logs and tests that Falcon may desire. Rule 6(a) would require operators to use casing centralizers when running cement behind the casing. Rule 6(e) seems to imply that Falcon would be the final arbiter of whether or not the cement bond log proved that the storage interval had been effectively isolated and allows Falcon to compel the driller to conduct further cementing operations (see Attachment "A"). These examples illustrate the possible additional costs in time and money that might be born by operators drilling through the storage interval.

Falcon argues that the Railroad Commission has the authority to enact field rules reasonably calculated to prevent waste of natural gas from the Worsham-Steed reservoir based on the language of Texas Natural Resources Code §§85.045 and 85.046(11). However, Falcon failed to present any evidence that proposed Rules 1 - 5 and 9 would result in the actual prevention of waste.

DISCUSSION OF THE EVIDENCE

The Worsham-Steed Field was discovered in the early 1940's at approximately 4,700'

subsurface depth. Special field rules were initially adopted by Commission Order No. 9-3583, effective April 6, 1942. Current field rules provide for minimum well spacing of 330'/933' (leaseline/between well), 40 acre density and an allocation formula based on 50% acreage and 50% per well. The Commission proration schedule shows one operator and one well in the gas field. The oil schedule indicates three operators: Wolsey Well Service and J.M. Petroleum (both with non-producing wells) and Falcon Gas Storage Co. with 37 wells (6 wells are the storage unit injection wells, the remainder either have Statewide Rule 14(b)(2) plugging extensions or are shut-in).

The unitized formation for the Gas Storage Unit is in the Bend Conglomerate Formation which occurs between 4,608' and 4,658' as shown on the electric log of the Petco No. 18 Star Unit as originally identified as the Charlie Grace Drilling Company, Robin Rutledge Well No. 1 in the J.G. Garner Survey, A-233, Jack County. The unit boundaries of the subject reservoir are well defined.

The historical Commission actions have occurred as follows:

- * Order No. 9-3583, effective April 6, 1942, as amended by Order 9-16,114, effective July 25, 1949 and Order No. 9-22,324, effective November 22, 1951, adopted the operating rules for the field.
- * Order No. 9-68,616, effective June 19, 1978, authorizes a Gas Storage Project in the Worsham-Steed Field. Texas Utilities Fuel is authorized to operate a gas storage project. Wells may be used for injection or withdrawal. Accounting method for injected gas and native gas and liquid hydrocarbon adopted.
- * Order No. 9-77,840, effective March 22, 1982, approved Texas Utilities Fuel Co. certification of a tertiary recovery project. As a gas storage facility, natural gas injection will be by a miscible fluid displacement technique and will increase the ultimate recovery of oil from the reservoir.
- * Order No. 9-79,575 effective July 30, 1984, authorizes expansion of the Gas Storage and Tertiary Recovery Certification.

Falcon continues to operate the facility as a gas storage and tertiary recovery project. There are concerns that improper drilling, well completion or well plugging by other operators drilling through the unit to underlying fields, such as the Newark, East (Barnett Shale), could cause oil or gas in the Worsham-Steed reservoir to migrate outside the reservoir. Falcon asserts that its proposed rules are necessary and reasonable to protect the integrity of its storage unit.

EXAMINERS' OPINION

There are many gas storage reservoir facilities in the state that were once productive of native hydrocarbons. Prior to becoming gas storage reservoirs, the fields were governed by either Statewide Rules or special field rules. Because future wells may be drilled through a storage reservoir for exploration of deeper formations, special field rules are necessary to prevent waste and protect correlative rights by ensuring the containment integrity of the storage reservoir against the possible migration of stored gas through wellbore penetrations to intervals other than the intended gas storage reservoir.

Historically, the Commission has adopted rules that provide isolation of the storage reservoir by the placement of cement from a point below the gas storage reservoir to a point above the gas storage reservoir through either block squeezing, deviation tool (DV Tool) or circulating cement from the casing shoe to a point above the storage reservoir. The exact location of the storage reservoir is determined by that well's electric log. The cementing company certifies the setting depth, slurry volumes, etc. A temperature/cement bond log verifies locations and bonding. If a well is a dry hole or is plugged back to a formation above the storage reservoir, a plug is set from a minimum prescribed point below and a point above the gas storage reservoir.

These requirements are basically stated in Falcon's proposed Rule Nos. 6 & 8. Rule No. 7 is already addressed by Commission Statewide Rule 17 - Pressure On Bradenhead. However, the other proposed rules: required notice with specific timelines, additional logging or testing required by Falcon, the filing of various Commission required completion/plugging forms with Falcon are either beyond the Commission's authority or are redundant as the forms are of public record with the Commission and available for public viewing and scrutiny. As an operator of the storage unit, Falcon should know when a rig is moving-in within its storage unit boundaries. Inquiries/introductions can be made between Falcon and the appropriate parties. Numerous wells have been drilled through the numerous gas storage facilities within the state through many decades without the need for the detailed Proposed Rules. With the exception of proposed Rules 6 and 8, Falcon's proposed rules would considerably increase the expense and burden on other operators without significantly increasing the protection of correlative rights or prevention of waste. The extensive control sought by Falcon over exploration and development of the minerals below its storage reservoir can be achieved by Falcon acquiring the rights to those minerals. Field rules for the Worsham-Steed Field are not an appropriate means of limiting the exploration and development of the mineral resources below the storage interval that are owned by other entities.

The examiners' propose that only a rule addressing the physical isolation of the storage reservoir be adopted. In addition, the Special Field Rules as adopted in Order No. 9-3583, effective April 6, 1942, as amended, should be cleaned-up and re-numbered as many of the rules as adopted in 1942 are now addressed by the Commission's Statewide Rules.¹

¹ The rules include: casing strings, blowout preventers, well equipment, tubing size, GOR, testing.

FINDINGS OF FACT

1. Notice of this hearing was sent to all operators in the subject field area at least ten (10) days prior to the subject hearing.
2. There was no protest at the call of the hearing.
3. The Worsham-Steed Field was discovered in the early 1940's at approximately 4,700' subsurface depth.
 - a. The field rules for the Worsham-Steed Field were adopted in Order No. 9-3583, effective April 6, 1942, as amended providing for minimum well spacing of 330'/933' (leaseline/between well), 40 acre density and an allocation formula based on 50% acres and 50% per well.
4. Order No. 9-68,616 effective June 19, 1978, authorized a Gas Storage Project in the Worsham-Steed Field. Texas Utilities Fuel was authorized to operate a gas storage project in the subject field.
 - a. The unitized formation for the Gas Storage Unit is in the Bend Conglomerate Formation which occurs between 4,608' and 4,658' as shown on the electric log of the Petco No. 18 Star Unit as originally identified as the Charlie Grace Drilling Company, Robin Rutledge Well No. 1 in the J.G. Garner Survey, A-233, Jack County.
 - b. The unit boundaries of the subject reservoir are well defined.
5. Order No. 9-77,840 effective March 22, 1982, approved Texas Utilities Fuel Co. certification of a tertiary recovery project.
6. Order No. 9-79,575 effective July 30, 1984, authorizes expansion of the Gas Storage and Tertiary Recovery Certification.
7. Drilling, well completion or well plugging by other operators drilling through the gas storage unit to deeper fields, such as the Newark, East (Barnett Shale) could cause oil or gas in the Worsham-Steed gas storage reservoir to migrate outside the reservoir.
8. The proposed rules, as stated in the attached Order, will provide for the containment and prevention of hydrocarbon migration from the gas storage unit reservoir by the following means:
 - a. Isolation of the storage reservoir by placement of cement from a point 100 feet below the gas storage reservoir to a point 100 feet above the gas storage reservoir through either block squeezing, deviation tool (DV Tool) or circulating cement from the casing shoe to a point 100 feet above the storage reservoir.
 - b. If a well is a dry hole or is plugged back to a formation above the storage reservoir,

the operator shall place plugs that effectively isolate the gas storage reservoir from other formations either above or below the unitized horizon.

CONCLUSIONS OF LAW

1. Proper notice was given to all parties as set out in the provisions of all applicable codes and regulatory statutes.
2. All things have occurred and been accomplished to give the Commission jurisdiction in this matter.
3. Consideration of field rules, a determination of their effectiveness and appropriate actions is a matter within the Commission jurisdiction.
4. Adoption of the proposed amended field rules, as stated in the attached Order, will maintain the integrity of the storage reservoir and thereby prevent waste, foster conservation and protect correlative rights.

EXAMINERS' RECOMMENDATION

Based on the above findings and conclusions of law, the examiners recommend approval of amending the field rules for the Worsham-Steed Field as indicated on the attached Order.

Respectfully submitted,

Thomas H. Richter, P.E.
Technical Examiner
Office of General Counsel

Marshall Enquist
Hearings Examiner
Office of General Counsel

ATTACHMENT “A”
PROPOSED FIELD RULES BY FALCON GAS STORAGE

- Rule 1 For each well proposed for drilling (including re-entry or re-completion of existing wells) through any portion of the lands located within the unit boundaries of the Gas Storage Unit as specified in TRRC Oil and Gas Docket 9-68,616, as amended in Oil and Gas Docket No. 9-77840 and Oil and Gas Docket 79,575 (“Unit Boundary”), that penetrates the Unitized Formation, the well operator of the proposed well shall furnish to Unit Operator by facsimile transmission to (713-961-2676) (i) a copy of the W-1 drilling permit as approved by the TRRC, said copy to be furnished within two (2) business days of such approval and (ii) written notice of the date on which the drilling of any such well is actually commenced, said notice to be furnished contemporaneously with its commencement.
- Rule 2 For each well drilled within the Unit Boundary that penetrates the Unitized Formation, the well operator shall provide to Unit Operator not less than five (5) days notice of the date upon which the well operator estimates that any open hole logs or other tests are to be conducted. Notices to be given under this Rule 2 shall be given to Unit Operator by facsimile transmission to (713-961-2676).
- Rule 3 For each well to be drilled within the Unit Boundary that penetrates the Unitized Formation, at the time that a well operator conducts open hole logs or tests, the well operator shall also conduct or cause to be conducted such additional open hole logs or other tests within the Unitized Formation as the Unit Operator may reasonably request. The Unit Operator shall be responsible to pay any and all incremental charges and costs of whatever nature directly related to and incurred by the well operator or its affiliates in conducting such logging or tests solely within the Unitized Formation, including but not limited to, costs or charges for rig time, employee time, any third party charges, and any out of pocket expenses. After completion of the requested logging or tests, the well operator shall identify and tabulate the subject costs and charges and present an invoice for the same to the Unit Operator who shall pay the invoiced amounts promptly but no later than thirty (30) days after the date of the invoice. The Unit Operator shall provide the well operator with a written description of the well logs or tests that the Unit Operator desires the well operator to conduct with sufficient notice so that such logs or tests do not materially impact the well operator’s operations. If the Unit Operator desires the well operator to conduct drill stem and/or formation tests within the Unitized Formation, Unit Operator shall provide the well operator notice of such tests within two (2) business days of receipt of the approved form W-1 drilling permit, as provided in Rule 1(i). Unit Operator’s failure to provide notice of its desire to have drill stem and/or formation tests within the two (2) business days of receipt of the approved W-1 drilling permit shall relieve the well operator of its obligation to perform these tests. The well operator will not be required to conduct the requested logs or tests unless the Unit Operator agrees in its written request to be responsible for the costs and charges addressed herein and agrees to indemnify the well operator for any and all damages and losses that may result from conducting such logging or tests, including but not limited to the loss or reduction of the well’s productivity, costs to repair or restore well productivity, death or personal injury, and damage to property. Unit Operator shall have no responsibility for losses caused by the negligence of the well operator. If Unit Operator fails to pay the well

operator for costs and charges as invoiced, the well operator, in addition to its remedies for recovery of payment, shall not be required to conduct any further logging or tests requested by the Unit Operator.

Rule 4 For each well within the Unit Boundary that penetrates the Unitized Formation, the Well Operator shall provide to Unit Operator copies of completion forms submitted to the TRRC. Such copies shall be delivered to Unit Operator by United States mail, postage prepaid, contemporaneously with transmittal of any such form to the TRRC.

Rule 5 For each well within the Unit Boundary that penetrates the Unitized Formation, when the well reaches total depth, the well operator shall cause the open hole logs that it deems appropriate to be run in the well. The well operator shall provide Unit Operator with only a copy of the log heading for each log run and a copy of the portion of logs covering the Unitized Formation. Well operator shall also provide documentation setting forth the requested testing and results of any tests conducted under Rule 3. Notwithstanding any other rule for the Worsham-Steed Field, the Unit Operator shall not have access to the logging truck or derrick floor during the logging or conducting of any test.

Rule 6 For each well within the Unit Boundary in which production casing is to be set through the Unitized Formation, the setting of such casing shall be accomplished in accordance with the following:

- a. Casing centralizers shall be placed on every other joint of the production casing on the first six joints below the base and above the top of the Unitized Formation.
- b. Cement shall be pumped in the casing/bore hole annulus to establish an impermeable cement bond throughout the interval beginning 100 feet below the base of the Unitized Formation and extending upward to a depth 100 feet above the top of the Unitized Formation.
- c. A cement bond log shall be run across the interval identified in "b" above no sooner than 24 hours after cementing activity is concluded and prior to commencement of any completion activities in order to verify the isolation of such interval.
- d. A copy of the cement bond log shall be provided to the Unit Operator at the time it is run.
- e. In the event that the cement bond log run after the primary cementing operation shows that the Unitized Formation has not been effectively isolated, the well's operator shall perform remedial operations sufficient to isolate the Unitized Formation as above described. Such operations shall be verified by the running of subsequent cement bond logs.

Rule 7 For each well within the Unit Boundary that penetrates the Unitized Formation and for which production casing is set, the well operator shall install, or cause to be installed, a gauge to monitor pressure on the Bradenhead for the well and the well operator shall cause the gauge to be read not less often than weekly. If the pressure gauge shows the presence

of unanticipated pressure, well operator shall promptly notify Unit Operator by facsimile (using number (713-961-2676)) of the presence of such pressure and facts regarding it and shall take steps to remediate the conditions causing the unanticipated pressure.

Rule 8 For each well located within the Unit Boundary that penetrates the Unitized Formation and results in a dry hole or is completed in a zone above the top of the Unitized Formation, a cement plug shall be placed in the bore hole starting at a depth 100 feet below the base of the Unitized Formation and extending up to a depth of 100 feet above the top of the Unitized Formation. In like manner, at the time that a well with casing set through the Unitized Formation is plugged and abandoned or plugged back to a depth above the Unitized Formation, then, a cement plug shall be placed in the bore hole starting at a depth 100 feet below the base of the Unitized Formation and extending up to a depth of 100 feet above the top of the Unitized Formation. As to each well to be plugged or plugged back under this Rule 8, the existence of the cement plug shall be verified by “tagging” after sufficient time has elapsed for the cement plug to set up. In connection with plugging activity conducted under this Rule 8, well operator shall provide to Unit Operator a copy of the applicable W-3 plugging report submitted to the TRRC, such form to be delivered to Unit Operator by United States mail, postage prepaid, contemporaneously with transmittal of any such form to the TRRC.

Rule 9 Once Unit Operator receives notice provided under Rule 1(i), Unit Operator shall provide notice to the well operator of the current known pressure in the Unitized Formation. Each well operator drilling, completing or operating a well that is, or is planned to be, drilled within the Unit Boundary through the Unitized Formation shall employ equipment and methodology that would be utilized by a prudent operator while conducting such activity in an environment in which the wellbore extends through the Unitized Formation.